COMPUTERWORLD

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

Weekly Newspaper – Second-calss postage paid at Boston, Mass.

Vol. 2 No. 52 | December 25, 1968 | Price: $9/year

CDC Lists Charges Against IBM

ST. PAUL, Minn. – Control Data Corp. entered suit against IBM for an antitrust action last week, claiming that IBM had breached the Sherman Act both through actual and attempted monopolization of interstate and foreign computer markets and submarkets.

IBM responded by pointing out that Control Data is growing faster than IBM and that the Control Data complaints are apparently contradictory. On the one hand, according to IBM, Control Data contends that there is insufficient competition and on the other that there is too much. IBM stated that it intends to defend itself vigorously.

The complaint was filed in the federal court here and asked treble damages for past violations of the Sherman Act and for injunctive relief against continuing violations.

The request for damages is based on orders for Control Data computers, particularly 6600s, which CDC contends were either lost entirely or involved additional marketing costs because of irregular marketing activities by IBM. These are the same activities from which Control Data seeks court relief.

Paper Machines

The complaint specifically mentions misrepresentation by IBM of the status of computers which CDC feels involve "paper machines and phantom computers." Control Data claims that premature announcements of IBM computers have deprived competitors of sales. CDC also claims that as a result of premature marketing IBM later has been forced to change, delay, or even cancel announcements. Control Data argues that this has created additional costs and also has resulted in precurements being deferred until the IBM systems were ready for full marketing.

Failure to Fulfill Obligations

CDC also alleges that IBM has repeatedly failed to fulfill its obligations after entering into contracts, commitments, and accepted letters of intent. This is stated to have caused competitors to be deprived of sales which they would have been able to obtain if IBM has promised only what it actually later delivered.

Discriminatory Pricing

In addition to paper machines,

(Continued on Page 16)

Expansion of DOS Features Planned

WHITE PLAINS, N.Y. – Twelve active programs, instead of three, will be able to run on IBM 360 computers using the Disk Operating System next spring, IBM has announced.

Currently, only three programs can run at one time – one background and two "foreground" operations. The background program normally is a batch processing job, such as a compilation or a sort, while the foreground programs usually involve real-time or massive printing applications, such as inquiry systems, large reports, and data collection systems.

Still 3 Main Programs

The new facilities will not increase the number of main programs which can run at one time – but they will increase the power of the individual programs to initiate execution of subsidiary programs. The subsidiary program can be functionally unrelated to the main program, but it will normally work on data brought into memory by the main program.

Each main program, whether it is a background or foreground program, will be able to have up to nine of these subsidiary programs, any number of which can be activated by the main program. There is, however, a limitation of nine on the total number of subsidiary programs which can be active simultaneously. This includes all subsidiary programs under all three main programs operating in the system.

OS Equivalent

A facility somewhat equivalent to this has been implemented under the full OS for some time. This approach has been found to be very useful in designing and running on-line programs with real-time applications. The subsidiary programs, which use the data provided by the main program, often have handled functions such as exception reporting, special record handling, terminal messages, and special control routines.

Core Requirements

The modifications, when implemented, will require about 2000 positions of additional core for full utilization. Reprogramming will be required only if the user wishes to take advantage of this facility.

Improved Sort

A new version of the DOS Sort/Merge that will support the 2314 Direct Access Storage Facility, operate in any or all partitions, provide improved performance when sorting in partitions of over 56K, and enable improved I/O and exit capabilities, will be released with the improved multiprogramming facility.

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EDP Christmas

The Christmas season prevails at Honeywell's EDP Division, where secretary Barbara J. McDonald shows off a wreath made of old punched cards.

ACM's Financial Condition Gets Worse

By a CW Staff Writer

SAN FRANCISCO – The financial condition of the Association for Computing Machinery has continued to deteriorate, it became apparent at the ACM Council meeting here.

Despite the fact that working capital has dropped 40% to $86,058.33 in the last five months, and the fact that in terms of net worth the ACM is farther in the red, the council devoted only about four minutes to discussing finances.

At the council meeting in September, the treasurer accused the council of "financial irresponsibility." This time Treasurer Walter Hoffman simply told the council the report was grim.

The net worth of the ACM, estimated in June to be $70,000 in the red, was not provided this time. However, indications were that the ACM's net worth had continued to decline into the red, although probably the deficit is not greater than $120,000.

Conference Income

The only question raised by council members concerned income from the ACM conference in Las Vegas, which had been expected to provide an estimated $86,000 in revenue. Figures provided at the meeting indicated less than $11,000 income from the conference.

The explanation given was that the conference bills, instead of being paid by ACM headquarters, had been paid from Las Vegas, otherwise the income received at headquarters would have been much higher.

It was stated that $87,000 had been provided in the budget for "miscellaneous" conference expenses. No statement was made as to the gross income from the conference and no copies of conference figures were provided.

Cost Center Summary

The financial position of the ACM was not brought out clearly in the cost center summary, which was having its first workout. ACM adopted the cost center system at the beginning of this year.

It had been said that the new system would give members a clearer picture of exactly what was happening, but there seemed to be no relationship between the income and expense figures, and members found it difficult to understand items. The figures had not been distributed in advance, and there was little chance to study them in detail at the meeting.

Cobol Implementation Meets Opposition

GAITHERSBURG, Md. – Federal proposals for implementing the USASI Standard Cobol ran into serious objections from the computer industry at a special meeting here Dec. 16.

The meeting was called by Dr. Herbert Grosch at the National Bureau of Standards to obtain the computer industry's viewpoint on the four-level Cobol standard for the federal government.

The session was an informal affair, with suggested questions sent out in advance to those invited, but with no fixed agenda. The specific point of the meeting was to "avoid the disaster that ASCII faced when they attempted to introduce a standard," according to Dr. Grosch. The secondary purpose of the meeting was to allow the various affected federal agencies and the computer industry to raise their objections and have their viewpoints aired.

One of the basic differences between the adoption of the ASCII standards and the federal government's decision to adopt a standard is that ASCII standards are completely voluntary and the federal standards would not be voluntary, according to Dr. Grosch.

Government 10% of Market

Another point brought out by Dr. Grosch was that the govern-

(Continued on Page 14)

NOTICE TO ADVERTISERS

Computerworld's weekly paid circulation is now over 25,000 – 66% greater than the 15,000 circulation upon which current advertising rates are based. By January 1, 1969, we expect paid circulation to exceed 30,000 – double the current rate base.

To reflect rising costs associated with this increased circulation, *Computerworld* announces new advertising rates effective January 1, 1969. The new rates, averaging a 30% increase, are modest, considering the great growth in the circulation base, higher postal charges, higher labor charges, etc.

Computerworld now offers the lowest cost per 1,000 of any computer-oriented publication. Even with the new rates in effect, the cost per 1,000 is still the lowest available.

Additional information on the new rates can be obtained by contacting Neal Wilder, National Sales Manager, Computerworld, 60 Austin St., Newton, Mass. 02160, (617) 332-5606, or any regional sales office.

Galler Invites ACM Council To Put Ethics on Its Agenda

By a CW Staff Writer

SAN FRANCISCO – Questions regarding the ethical guidelines of the Association for Computing Machinery may come up at the next ACM Council meeting, if the council accepts the invitation of ACM President Bernard A. Galler to put the question on the agenda.

Galler extended the invitation after he was questioned at this month's council meeting on the accuracy of a *Computerworld* article stating that the ACM would not arbitrate ethical disputes. Galler said the article was accurate. The discussion made it apparent that at least some council members were not aware such a decision had been made.

"If it [the statement] is right, why did we adopt the guidelines?" was one comment passed.

New Afips Constitution

The question of ethics also came before the council in connection with the proposed new constitution for the American Federation of Information Processing Societies (Afips), of which ACM is a member. The constitution, which took 2-1/2 years to draft, was introduced as an additional agenda item.

Questions were raised by Saul Gorn and Herbert R.J. Grosch, council members at large, about the impact of the proposed constitution.

Gorn, who said he was worried about the ethical differences between professional societies and trade associations, voted against putting the constitution up for a quick mail ballot without discussing its effects. However, the majority favored proceeding with a mail vote.

Afips, a federation of ACM, the Institute for Electrical and Electronics Engineers (IEEE), Simulation Councils, and the American Society for Information Science, runs the Spring and Fall Joint Computer Conferences and is a major contributor to ACM finances. A recent extraordinary distribution of its surplus netted the ACM $86,000 more than it had expected. Without these funds, ACM would now be out of working capital.

Artist Wins Place in Publication

WELLESLEY HILLS, Mass. – Gael Burns, art director at Honeywell's Electronic Data Processing Division here, has won a place in the international *Graphis Annual.* Published in Zurich, *Graphis* receives more than 17,000 entries from art directors in some 40 nations each year.

Burns submitted a brochure he designed on a computer programming package called Facile.

Gael Burns

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Brokerage System Designed To Catch Errors by Humans

NEW YORK – One of the major problems contributing to Wall Street's mammoth paperwork glut has been human errors. Once made, they often take days to detect and result in "fails," a failure to deliver stock by the fifth business day following a transaction.

One brokerage firm is trying to counteract this problem by bringing data processing right into the "cage," the cashier's area where securities and money are received, processed, and delivered.

"By bringing electronics into the cage, the system increases clerical accuracy in this phase of processing by 98%," said Samuel A. Gay, partner in charge of operations for Paine, Webber, Jackson, and Curtis.

Each stock arrives in the cage with a ticket attached, carrying the name of the stock, number of shares, and customer's account number.

System Error Prone

Under the old system, a clerk searched by hand for the stock's computer code number in a tub-file containing alphabetized stocks. Once located among the 35,000 issues on file, the code number was written on the ticket. This data was then keypunched for entry into the system.

Errors, which could occur in selecting the wrong stock from the tub, in writing down the wrong code number, or in keypunching, sometimes took two days to show up in stock record keeping after they were entered into the system.

Cross Check System

Under the new system, an operator at a CRT terminal, using the stock certificate and attached ticket, calls up the specific stock by name from the computer's file. This provides her with the stock's computer code number.

She adds, via the terminal's keyboard, the customer's account number, number of shares, and disposition of the stock. This data appears on the CRT for verification and then is entered into the system.

The computer next prints out a confirmation on a receive-only Teletype, repeating the details of the transaction. After verification, the printout, ticket, and certificate are microfilmed and sent to their proper location.

Uses Existing Equipment

The new system uses the backup Control Data 8090 switching computer that is part of the system which controls messages and securities orders between Paine, Webber's 63 offices and the floors of the New York and American Stock Exchanges.

The system was proposed by Donald E. Browr, Paine, Webber data processing manager, and implemented by Control Data.

As a terminal operator calls up a list of stocks to obtain the computer code number for a particular stock, another employee strips confirmations off a Teletype.

Williams Receives Leeds Award At National IEEE Conference

Special to Computerworld

CHICAGO – The National Electronics Conference, sponsored by the Institute of Electrical and Electronic Engineers, presented its annual Morris E. Leeds Award to Albert J. Williams, Jr.

Williams is a consultant to the Leeds & Northrup Foundation and the IEEE. He received a $500 honorarium and a citation "for outstanding contributions to electrical instrumentation and measurement."

The conference, held Dec. 9-11, included the presentation of more than 200 papers in 40 technical sessions. Several panel discussions were held, along with refresher seminars and various symposia.

10% Data Rate Reduction Is Proposed by Comsat

WASHINGTON, D.C. – A 10% reduction in rates on certain overseas data transmission services, including computerized data, via satellite, has been proposed by the Communications Satellite Corp. (Comsat). The firm asked the Federal Communications Commission to approve a plan under which Comsat could lease a package of 12 voice grade channels for approximately 90% of what it would cost to lease the same 12 channels individually.

Initially covered by the new rates would be services linking the U.S. mainland with Hawaii and Spain. The proposed rate for the U.S.-Spain service is $41,000 per month, while the U.S.-Hawaii service charges would be $58,200 monthly. Comsat said the discounts would be of benefit primarily to large volume customers, chiefly the federal government.

The communications agency has asked the FCC for permission to start the new service immediately, skipping the normal 30 day waiting period, because of heavy expected volume at this time of the year.

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IPS has for sale or lease in the next 90 days several medium- and small-size systems. Included are an H-1400 tape/card/printer system, a GE-225 tape system, a 1440 16K 3-1311 system, a 1410 80K tape/disc, and 4K and 8K 1401's. For 360's, we have 2311's, a 2841, and 2821 I. For clients, we are looking for a H-200 32K 4-tape system, a 1401/1405 12K-16K, an RCA 301, an 1107, and 360 equipment. For details, please call or write.

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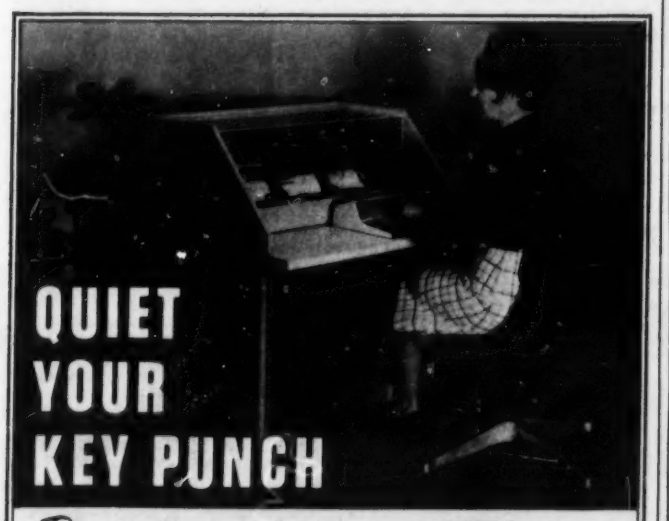

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Editorials

ACM Fiscal Irresponsibility

The ACM Council, warned in September by its own treasurer that it was "financially irresponsible" and still faced with growing debts, gave only perfunctory attention to the latest financial report this month.

Four minutes of discussion, the time devoted to the treasurer's report, seem hardly adequate with working capital down 40% in only five months to $86,058.33 and liabilities exceeding assets by more than $100,000.

It wasn't even clear whether the ACM made or lost money on the Las Vegas conference, although the figures seemed to indicate a net profit of $11,000.

Perhaps it's time for the council to find out if the ACM qualifies for any antipoverty programs.

Public Relations and Public Interest

The success of advance public relations for the Fall Joint Computer Conference was obvious. The exhibit halls were crowded. In talking to the exhibitors, both in the main halls and in the hotels surrounding the conference site, all expressed pleasure with the quality as well as the quantity of the turnout. Technical sessions were equally well attended as were the many concurrent sessions of the sponsoring societies.

Perhaps not so obvious was the public relations for the general public. The most important question insofar as the general public is concerned is the effect of computers on our society. Some want to use them to forge ahead to improve society. Others want to restrict their use so as to retain individual privacy. Most of us are confused because we do not see to what extent these two demands can be reconciled.

Public relations, however, made its most significant contribution when it brought together a blue ribbon panel which included a Nobel Prize winner, professors from Harvard, Columbia, etc., for a TV discussion of these varying viewpoints. Praise is deserved for this, and we hope that the tapes – audio and video – of these discussions will be widely used. They are available, and they are excellent. They should be studied by society chapters and broadcast by radio and TV stations. They illustrate the complexities of the problems and the basic good will of all parties.

In the public interest, these tapes should be used.

COMPUTERWORLD
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Weekly Newspaper – Second Class Postage Paid at Boston, Mass. Published every Wednesday by COMPUTERWORLD, Inc., 60 Austin St., Newton, Mass. 02160. Telephone: (617) 332-5606 & TWX: 710-335-6635. Copyright 1968 by COMPUTERWORLD, Inc. *Alan Taylor*, Editor in Chief. *Robert M. Patterson*, News Editor. *Neal Wilder*, National Sales Manager. *Henry Fling*, Production Director. *M. Phelan*, Circulation Manager. *Frederick Anderson, Jr.*, Financial Editor. *Joseph Hanlon, Kate Rachstein, Ginny Berthold, Evelyn Cowell, Elly Tennenholtz:* Assistant Editors. *Christine Reed*, Advertising Service Manager. *Karen Aylsworth*, Advertising Coordinator. *Patrick J. McGovern*, Publisher. *W. Walter Boyd*, Associate Publisher.

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Viewpoint

Maintenance Charges Should Reflect The Economic Facts of the Situation

By James P. Hassett
President, Cyber-Tronics, Inc.

It was quite a surprise to note in the Nov. 20 issue that CW credits MAI, Inc. as the only leasing company ready for potential increases in maintenance charges. Cyber-Tronics, Inc., for many years, has had extensive capabilities for the maintenance and reconditioning of data processing equipment.

CTI was founded almost 10 years ago on the concept that maintenance service was the key to success in the data processing industry. We have continuously strengthened and improved our ability in this area, and we have consistently highlighted the necessity of creating a capability, independent of IBM, in maintenance, modification, and systems service. As stated in our most recent prospectus, we believe that maintenance is "... an element of competitive advantage in the data processing equipment leasing business." The recent gyrations of IBM in the maintenance pricing area have served only to underscore this point. More of this later.

J. Hassett

Costs Reported

To further emphasize our feelings about maintenance and service, we have always reported to our stockholders the actual dollar cost of maintenance, together with the amount of equipment which we own and service. We do this so that the facts may speak for themselves, and so that management's performance in this critical area is clearly highlighted by the figures. Parenthetically, I have always been at a loss to understand why this practice is not followed by MAI, since I am sure that its stockholders would find the information interesting.

Charges Should Be Based on Cost

Returning to the recent IBM price change concerning maintenance service and its subsequent recision after three days, our position is quite simple. We strongly believe that all companies, including IBM, should base their charges for services upon the economic facts of the particular case. We are strongly opposed to charging less than cost for certain services in order to advance certain corporate objectives. Conversely, charges which are greatly in excess of cost, and on which unreasonable profits are being made, can be corrected by the free operation of the market system, provided that free competition is allowed to prevail.

As a case in point, one of the main reasons we do not now service any IBM 360 computer systems is because the margin between actual costs and current IBM charges would not be sufficient to permit us to make a reasonable profit, when compared with other corporate opportunities. However, we do maintain a capability "in being," so that should an arbitrary and uneconomic price increase be forced upon us by IBM, we would be in a position to protect our investment in 360 computer systems by performing the maintenance ourselves. In addition, such a price increase would afford us an attractive corporate opportunity to obtain additional IBM 360 maintenance service from other owners. This is the way we feel a free competitive market should operate.

Changes Cancelled Each Other

When we received the notice of IBM's price increase followed by the recision, we informed IBM of our position, basically as stated above. Interestingly enough, the net effect on Cyber-Tronics was nominal, not because our customers bore the brunt of the price increase, but because our equipment mix is such that IBM's changes (both up and down) effectively cancelled themselves.

This particular aspect of the IBM price change has been ignored by most observers. There are undoubtedly many owners of IBM equipment who would have benefited from the proposed price changes; however, IBM chose to listen to the more vocal elements in the industry. The IBM recision, while welcomed by some of these shortsighted managements in the data processing business, will in the long run prove detrimental to their own interests. Arbitrary changes in pricing policy can do no one any good in the long run. The basic problem remains: charges are not necessarily geared to economic factors.

Problems of Arbitrary Pricing

This arbitrary method of pricing inhibits many companies from developing or expanding their capability, and thus limits overall competition. The net effect of these policies is to reduce the number of options available to owners of IBM equipment, and consequently to maintain the present concentration of ownership.

As a further example of myopic vision, very little has been said about the gyrations of IBM parts prices. To those companies who have had experience in purchasing parts directly from IBM, price fluctuations of several multiples, in the interval from one price book to another (six months time), is not uncommon. It is obvious that many of these charges are arbitrary, and once again bear little or no relation to the economic factors. In the unit record equipment area, this form of parts pricing has resulted in effective development of "second source" parts suppliers. I am quite sure that unless reforms are made, this trend will continue with respect to IBM 360 computer systems.

GSA Seeks Cost Breakdown

The above arguments are clearly recognized by those people with the foresight to see that fundamental changes in the present industry structure are required. Thus the General Services Administration, as the controlling agency for the U.S. Government's owned equipment, is in the process of pressing manufacturers to break out the various components of the present "all inclusive" rental charge.

Once this is accomplished, and charges are directly related to specific services, it will be possible for independent companies to compete in those areas where the charges are related to economic facts and costs. It will also become evident where charges are not so related. We heartily support the GSA objective.

Letters to the Editor

ACM Ethics

To the Editor:

Why all the flap?

In the final analysis, actions are taken by individuals separately. At a time when we wish to avoid anthropomorphism with respect to computers, we would do well to reflect again upon this fact with regard to organizations.

The action of a corporate body, be it professional or otherwise, is after all merely the summation of the actions of its people. The person who "thinks" otherwise simply kids himself into rationalizing away his responsibility for himself. Limited legal liability cannot be construed to mean limited moral responsibility by any stretch of the imagination. If our membership behaves ethically, how can our society be otherwise? To insist that the society "adopt" the guidelines is to ignore the fact that only people can be moral.

ACM is *already* on record. How else did we get the guidelines? The only answers required from our body corporate to ethical questions are (a) no dereliction was found or (b) at least some *one* was responsible. Corrective action has been taken.

I am returning your petition *unsigned* as evidence of both (a) my concern and (b) my strong feeling that *Computerworld* is mostly making waves.

In conclusion, let me assure you that my colleagues in the Birmingham Chapter too are concerned about professional responsibility. Perhaps we can all presently return to a *quiet* concern. Seldom does the ethical man have to say so.

Wade A. Norton
Vice Chairman
Birmingham Area Chapter
Birmingham, Ala.

Happy Reader

To the Editor:

I have been a subscriber of

(Continued on Page 5)

Research Report

Decision Tables Can Improve Documentation

By a CW Staff Writer

Certainly one of the major problems with the computer industry today is the difficulty encountered when managers try to communicate their problems to programmers and when programmers try to tell managers how they solved the problems.

This problem has developed to proportions at which companies lose enormous sums of money trying to explain and document a problem and its solution.

The concept of flowcharts really doesn't present a satisfactory solution. Flowcharts never seem to get updated because there is always more priority for beginning the next project than for completing the documentation on the last.

There are better ways. One in particular addresses itself to the problems cited above. Called Decision Translation, it is a technique of problem solving or system generation that uses tabular logic from the inception of the problem.

Tabular logic is concise and permits the man with the problem and the systems analyst to communicate with a sense of complete understanding. They discuss the hard core decisions and actions of what will be a computer based system.

```
LINE  C  STUB                                              RULES
                                                           1 2 3 4 5 6 7 8 9 10 11 12 13 14
000      TABLE A-123456 PROGRAM ILLUSTRA
010      THIS IS ALMOST A CLASSIC IN THE
020        ANNALS OF DECISION TABLES
030      CONDITIONS
040        CREDIT OK?                                      YNNN
050        IF CREDIT = 'OK'
060        PAY EXPERIENCE FAVORABLE                        -YNN
070        IF PAY-EX = '1'
080        IF SPECIAL-CLEARANCE                            --Y-
090        HE MAY BE THE SON OF THE BOSS
100      ACTIONS
110        APPROVE REQUEST                                 XXX-
120        PERFORM APPROVE
130          READ NEXT-APPLICATION, AT END GO TO ---X
140          COFFEE.
145        REQUEST IS REJECTED
146        NOTE THAT 'GO TO' WHEN USED IN THIS
147          FORMAT DID NOT BEGIN IN COLUMN 5, NOR
150          IS ITS OBJECT ON THE SAME LINE.
160        REPEAT                                          XXXX
```

Source coding for decision table processing.

The language they use is English, but it is not narrative. They are aware that a decision test, a question posed of potential data, has a binary answer, yes or no; that a series of decisions has a predictable number of possible binary combinations. They know that each combination of answers is either pertinent or not pertinent; if pertinent, certain actions are required and are indicated in the table of logic.

The manager and the analyst are communicating through the medium of a decision table. They check for completeness, contradiction, and redundancy.

The analyst leaves the manager to complete his tasks, but he does so with a sense of understanding. He may polish, refine, and embellish the logic tables but always with confidence that the manager can understand any changes because decision tables are easily understood.

Using Decision Tables

The tables are linked together, as are any set of subroutines, to create a program, but they always retain their tabular form. The programmer contributes the effort to complete the task. Perhaps he introduced additional decision tables into the system for data validation, error messages, I/O considerations, etc. The programmer writes no detail logic flowchart, he attempts no sequential charting of the logic.

Finally, the system is fully described in tabular logic form and the tables are keypunched, line for line. At this point the computer is used to create a program from the decision tables.

A number of translators are available today. The normal functions are:

1. To provide diagnostics on the logic of the solution.
2. To produce documentation in decision table format, to be read and understood at any time, by anyone.
3. To produce a program that is optimal in two senses.

a. It is conservative of core space, since actions are "written" only once and only the necessary minimum number of decision tests are coded.

b. The program is assembled using the principal of binary search logic, thus minimizing object program run time.

The benefits that accrue from the technique of decision translation are:

1. A communication bridge in the form of decision tables is created, effectively linking manager, analyst, and programmer into a communicating problem solving team.
2. Less writing and no detail flowcharting are required by the programmer.
3. Because of the logic diagnostics, fewer compiles are required to reach a production ready system.
4. Maintaining programs at the decision table level preserves the optimal features of the programs no matter how many modifications are made.
5. The time needed to produce systems is dramatically reduced.
6. The output of all programmers is uniform and, therefore, easily supervised.
7. Documentation of programs is always up to date no matter how many changes are made to a system.
8. The training of new personnel is greatly simplified because the documentation is so easy to comprehend.

Several decision table compilers are currently available. They are presently oriented toward Cobol users, and provide either a tailored compiler or an extra step processor that develops the decision tables from the source code.

Decision tables may not be the ultimate solution to our communications and documentation problems, but they do present a more useful tool than other techniques currently available, and they can significantly reduce costs.

```
                TABLE A-123456  PROGRAM ILLUSTRA
                ORIGINAL TABLE

    010   * THIS IS ALMOST A CLASSIC IN THE
    020   *   ANNALS OF DECISION TABLES
    030   CONDITIONS
    040   * CREDIT OK                                    YNNN
    050     IF CREDIT = 'OK'
    060   * PAY EXPERIENCE FAVORABLE                     -YNN
    070     IF PAY-EX = '1'
    080     IF SPECIAL-CLEARANCE                         --YN
    090   * HE MAY BE THE SON OF THE BOSS
    100   ACTIONS
    110   * APPROVE REQUEST                              XXX-
    120     PERFORM APPROVE
    130       READ NEXT-APPLICATION, AT END GO TO ---X
    140       COFFEE.
    145   * REQUEST IS REJECTED
    146   * NOTE THAT 'GO TO' WHEN USED IN THIS
    148   * FORMAT DID NOT BEGIN IN COLUMN 5, NOR
    150   * IS ITS OBJECT ON THE SAME LINE.
    160     REPEAT                                       XXXX
```

Sample pre-compile output, showing choices at each decision point. ('Y' indicates a yes, 'N' indicates a negative, and '-' indicates no action)

```
                TABLE A-123456  PROGRAM ILLUSTRA
                EDITED TABLE

          010   * THIS IS ALMOST A CLASSIC IN THE
          020   *   ANNALS OF DECISION TABLES

                CONDITIONS

C1        040   * CREDIT OK                                 N N N Y
          050     IF CREDIT = 'OK'

C2        060   * PAY EXPERIENCE FAVORABLE                  N N Y -
          070     IF PAY-EX = '1'

C3        080     IF SPECIAL-CLEARANCE                     N Y - -
          090   * HE MAY BE THE SON OF THE BOSS

                ACTIONS

A4        110   * APPROVE REQUEST                          - X X X
          120     PERFORM APPROVE

A5        130       READ NEXT-APPLICATION, AT END GO TO X - - -
          140       COFFEE.
          145   * REQUEST IS REJECTED
          146   * NOTE THAT 'GO TO' WHEN USED IN THIS
          148   * FORMAT DID NOT BEGIN IN COLUMN 5, NOR
          150   * IS ITS OBJECT ON THE SAME LINE.

A6        160     REPEAT                                   X X X X
```

Sample compilation output, showing the generated Cobol statements to implement the decision logic.

Letters To The Editor

(Continued from Page 4)

your newspaper for several months now and think your news mix covering everything from technical through personnel to financial and legal developments is the best I've seen.

Charles C. Swanke
President
Diversified Computer Services, Inc.
Washington, D.C.

Hospital Systems

To the Editor:

The two page spread devoted to computer services and equipment available to hospitals [CW, Dec. 4] was very well done. Your method of describing various suppliers and users through separate news stories provided a ready reference guide with an interesting new twist.

There was, however, a point that I felt should be clarified in your description of GE's Medinet services. You indicated that the Teletype terminals were restricted to a single application because of an attached magnetic tape memory unit. Actually, the Teletype units are completely general purpose and can be used for any of Medinet's applications. Even the magnetic tape memory device is flexible; it has sufficient capacity to handle the transmission of fixed data for a number of applications.

Whatever limits might be placed on the use of the terminals for specific applications would be at the convenience of the hospital. Terminals are located in various parts of the hospital to gather data close to its source and to receive information where it will be used. We feel that this strategic placement of terminals ensures a higher quality of data flowing into the system.

Beyond the need for this qualifying comment, your description of Medinet service was quite accurate.

Ralph L. Zani
Manager-Marketing
Medinet
Watertown, Mass.

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TLW Computerworld Corner

	INDUSTRY
Item 1: 360/20 C1, 8K, 2560 A1, 2203. AVAILABLE 30 days.	Construction
Item 2: 1401 C4, 1402-1, 1403-2, 1406-1, 4-729 II's. Advanced Programming, Print Storage, Numerical Print, Hi-Lo Equal, and others. AVAILABLE 11/68.	Food
Item 3: 1401 C4 8K with 1402-1, 1403 and 3-1311's. AVAILABLE 90 days.	Manufacturing
Item 4: 1401 C4 12K, 1402-1, 1403-2, and 1406-2 AVAILABLE 30 days.	Banking
Item 5: IBM 1401 E5 12K with 4 7330's. AVAILABLE 30 days.	Banking
Item 6: 1401 C3 with Advanced Programming, Hi-Lo Equal, Print Storage, Serial I/O Adap. and 800 CPI. AVAILABLE 30 days.	Utility
Item 7: 7070 System 15K. 7150, 7301, 7501, 7600, 7604, 7802, and 8-729II's. AVAILABLE 30 days.	Rail

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Ask us about programs available with computers.

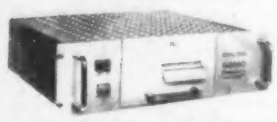
TLW COMPUTER INDUSTRIES

Small Tape Drive Is IBM Compatible

A new IBM compatible tape memory system, priced from $3500, includes both tape transport and data electronics in one unit. The TM-Z measures 19" wide, 24" high, and 16" deep and is comprised of three mechanical and three electronic modules. The capstan head assembly is pre-aligned to eliminate special alignment procedures. Models for 7 or 9 track recording are available. Ampex Corp., 401 Broadway, Redwood City, Calif.

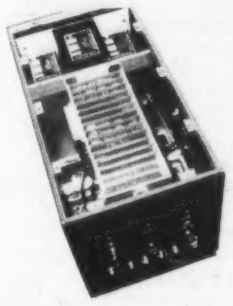
New Products

Printer



A new compact digital printer, Model 800A, has been designed with the printing mechanism, paper feed, and paper supply assemblies on a front opening door chassis. The unit measures 5-1/4" high by 17" wide by 17" deep, is electronically controlled, and of integrated circuit construction. The standard printer is capable of 10 lines per second numerics with up to 24 columns, and is available for either rack mounting or as a table model. Shepard Div., Vogue Instrument Corp., 480 Morris Ave., Summit, N.J. 07901.

Buffer Memory



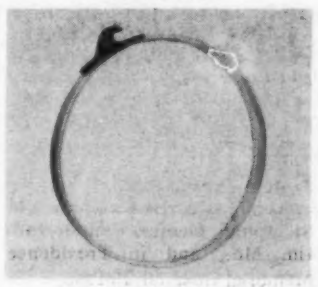
A new buffer system, type 611E, is IBM compatible to take outputs at the 1 MHz internal clock rate of the computer and output the data onto magnetic tape. The system presently operates in a ground environment but can be upgraded to airborne operation. In addition to data, system inputs include load command, shift in pulses, system clock, and unload command. Outputs are data and data clock. All interface levels are TTL integrated circuits. Storage is 6000 bits. Digital Devices Div., Tyco Labs, Inc., 200 Michael Dr., Syosset, N.Y. 11791.

Accounting Machine

A new computerized accounting machine priced at $6200 is a console unit consisting of an electronic digital computer with full printout, combined with an electric typewriter. The P203 prints alphabetic characters as well as numbers. A program card is inserted to start the automatic computer operation.

An electric typewriter keyboard permits typing of individual information on invoices, forms, and reports, while a preprogrammed computer section of the machine computes and prints out all figures automatically. Olivetti Underwood Corp., 1 Park Ave., New York, N.Y. 10016.

Reel Cover



A new computer reel cover constructed of lightweight plastic has a one piece reel hanger and cover lock combination that requires no fasteners. A hook and lock unit may be shipped separately for easy installation on the cover when placed in use. Protex Products Co., 2108 Payne Ave., Cleveland, Ohio 44114.

Disk Memory

A new disk memory, the 8000 series, may be used to extend core storage on small and medium sized general purpose computers, for buffer memory applications, as the main storage for special purpose computer systems, as a refresh memory for display systems, or an extender memory on electronic accounting machines. The unit uses fixed, nonpositioning flying heads in a head per track configuration. Compatible with most integrated circuits, all logic interfacing is accomplished at positive levels through a single connector. Information Storage, Inc., 8260 E. Eight Mile Rd., Detroit, Mich. 48234.

smtwtfs calendar smtwtfs

Jan. 17-21, London, England – Trade Fair on Computer Display Exhibits. Contact: Commercial Exhibits Div., BIC-932, Dept. of Commerce, Washington, D.C. 20230.

Jan. 22-24, New Orleans, La. – Applying Systems Analysis to Management of Public Programs. Contact: Robert M. Carlisle, Seminar Director, 1009 Bradbury Dr. S.E., University Research Park, Albuquerque, N.M. 87106.

Feb. 13-14, Las Vegas, Nev. – Adapso Management Conference. Contact: J.L. Dreyer, Adapso, 420 Lexington Ave., New York, N.Y. 10017.

March 10-12, New York – Annual EDP Conference. Contact: American Management Association, 135 West 50th St., New York, N.Y. 10020.

March 24-27, New York – IEEE International Convention & Exhibition. Contact: IEEE, 345 E. 47th St., New York, N.Y. 10017.

EDPeople on the move

Is Now		At	Was	At
G. William Teare, Jr.	President	Bru-El Graphics Falls Church, Va.	Data Processing Sales Manager	Fisher Stevens Inc. Clifton, N.J.
Daniel C. Benner	Manager Systems Services	Consumer Systems Corp. Chicago	Manager Management Systems	URS Systems Corp. Burlingame, Calif.
David Bird	Senior Programmer Analyst	Delta Data Systems College Park, Md.	Manager Commercial Applications	Bendix Corp.
Alphonse M. Lucchese	Director Corporate Marketing	Viatron Programming Inc. Burlington, Mass.	Marketing Representative	Data Processing Div. IBM Corp.
Fred H. Bonekamp	Vice President Marketing	Systems Science Corp. Wethersfield, Conn.	Project Manager	Data Processing Dept. Travelers Insurance Co.
Ralph A. Rankin	Senior Systems Programmer	Interactive Sciences Corp. Braintree, Mass.	Systems Analyst Control Systems Div.	Control Data Corp. Minneapolis, Minn.
Bradley Bealle	Instruction Administrator	Oyer Professional Computer Services, Inc. New York	Educational Consultant	Computer Usage Education Inc. New York
Alexander Kreithen	Vice President and General Manager	Information Management Inc.	Senior Vice President	Leasco Systems & Research Corp.
Raymond C. von Felten	Tape Development Manager	General Recorded Tape Inc. Sunnyvale, Calif.	Program Manager	FMC Corp. Sunnyvale, Calif.
Donald Gorman	Principal Analyst	Computer Usage Co. Inc. New York	Manager Special Programming Planning	Information Systems Div. RCA
Joseph D. Koenig	Vice President and General Manager	Data Equipment Group Data Products Corp.	Chief Engineer	Peripheral Systems Corp.

G.W. Teare, Jr.

D.C. Benner

D. Bird

A.M. Lucchese

F.H. Bonekamp

R. von Felton

New Literature

A brochure on lighting for better visual acuity in data processing areas has been published. The brochure may be obtained by writing to LSI Lighting Products, Inc., 615 Front St., Toledo, Ohio 43605, Dept. SP.

A new four page brochure, "Profits-Problems," outlines Associometrics' facilities for arriving at computer oriented solutions to complex commercial, industrial, and scientific problems. Write Associometrics, 5531 Dyer St., Dallas, Texas 75206.

A 36 page illustrated catalog has been published covering 434 accessories designed for use with electronic data processing. Data racks, data refs, punch card trays, and programmers' supplies are among the items included. Copies can be obtained free of charge from Wilson Jones, 6150 Touhy Ave., Chicago, Ill. 60648.

New brochures describe how documents, containing sought after information, can be located in minutes through a low cost information retrieval system. Jonker Corp., 26 N. Summit Ave., Gaithersburg, Md., 20760.

A users' guide containing general information on payroll taxes and guidelines for the design of payroll systems includes complete descriptions of the linkage, parameters, and interface procedures required for the Alltax software package. Management Information Service, Box 2[illegible], Stony Point, N.Y. 10980.

Hard Copy From Display

This new display copier, the IBM 2285, can produce a photocopy in 15 to 38 seconds, depending on the complexity of the image, according to IBM. The unit is designed to operate with the IBM 2250 display. The signals that produce the display are transferred, at the touch of a button, to a small CRT in the copier, and the image is projected onto 8-1/2" by 11" photosensitive paper. The copier rents for $700 and sells for $33,600.

13 Hospitals Form Group To Exchange Information

DULUTH, Minn. – A national organization has been formed to help correlate the activities of industry and hospitals in the continuing development of better services and systems.

Called Seek (Systems Evaluation and Exchange of Knowledge), the group is composed of representatives from 13 hospitals in Missouri, Texas, Alabama, Colorado, Georgia, Illinois, California, Minnesota, New Jersey, Wisconsin, and Pennsylvania.

Bob Byrne, director of planning and development for Providence Memorial Hospital, El Paso, Texas, was elected president of the new group.

The group has ordered a hospital information system from Medelco, Inc. The system, called This (Total Hospital Information System), is one of the new systems and is currently working in St. John's Medical Center, Joplin, Mo., and in Providence Memorial Hospital, El Paso.

The group claims that the system has nearly eliminated oral and written communication and replaced them with a punched card system that is nearly error free.

Representatives of more than 30 hospitals toured the Providence Memorial to see the system in operation.

Canning Asks Members to Submit Suggestions for ACM Seminars

NEW YORK – A request for proposals for professional development seminars has been announced by Richard G. Canning, chairman of the Association for Computing Machinery Professional Development Committee.

On the subject of data communications, the committee has written specifications and is seeking companies or individuals who will develop:

1. A one or two day introductory survey on "Data Communications Concepts."
2. A two day, intermediate level presentation on "Data Communications System Design."
3. A one day intermediate level presentation on "The Terminal Explosion."

Proposals should be submitted by Jan. 6.

The committee is developing specifications for other seminars, including:

1. "Managing Systems Analysis and Design."
2. "Managing Programming Projects."
3. "Information Systems Analysis and Design."
4. "Computer Program Design Concepts."

Specifications for the seminars can be obtained from J.M. Adams, director of education at ACM, 211 East 43rd St., New York, N.Y. 10017.

CALL FOR PAPERS

IEEE 1969 INTERNATIONAL SYMPOSIUM ON MAN/MACHINE SYSTEMS, Cambridge, England, Sept. 8-12. Submit abstract of not more than 300 words before Jan. 21 to Prof. W.T. Singleton, Applied Psychology Dept., University of Aston, Birmingham 4, England — or — Prof. L.R. Young, Room 37-155, Massachusetts Institute of Technology, Cambridge, Mass. 02139.

15th NATIONAL ISA AEROSPACE INSTRUMENTATION SYMPOSIUM, Las Vegas, Nev., May 5-7. Send brief synopsis, 50-100 words, of papers to Mr. E.K. Merewether, Manager, Computer Operations, Wyle Systems, 128 Maryland St., El Segundo, Calif.

Remote Interactive System Helps Students Pick College

Special to Computerworld

BOSTON – A system to help students find colleges right from the guidance office of their own high school is now available from Interactive Learning Systems, Inc. The system allows the student to enter the criteria which he wants in a college and matches these criteria against the file of over 2300 colleges, junior colleges, and universities.

The system, called ICSS (Interactive College Suggestion System), allows the student to choose the most important characteristic of the college he hopes to attend. The computer immediately tells him how many colleges fit his requirements. He then chooses the next most important characteristic and again the computer informs him of the number of remaining colleges which fulfill his requirements. After all such selection steps are completed, the computer types out a list of colleges meeting all the stated requirements.

The system can be used by a student alone, or with the assistance of his guidance counselor. The typewritten report, containing all the student's requirements, can be examined later by the student and the guidance counselor to discuss the student's choices and the reasons behind his criteria.

2300 Colleges on File

The basis of this system is the data file maintained by ICSS. The file contains over 200 facts about each college, with data on over 2300 colleges.

The language used by the student to tell the system what he considers important is quite simple. A list of numbered characteristics, which the student references, tells the student which command to select. There are detail command codes (see example) to tell the system either to consider only colleges which have this characteristic or only those which do not have this characteristic. The student can also check to see if a specific college is still within his selection group. The student can, whenever he wishes, list all colleges that still remain in his list, to avoid the problem of excluding several schools in which he is interested.

The system is inexpensive to operate, because the only significant costs to the school are the rental of a Teletype (many schools already have them), the costs for telephone time to the Boston computer center, and the nominal cost for actual computer time used.

The system uses a Burroughs B3500 computer, based in Boston, to process the requests and handle the teletypewriters. The system was developed from a research grant from the U.S. Office of Education and the basic development was done by Northwestern University in conjunction with the Educational Testing Service in Princeton, N.J.

```
LOGIN-
THIS IS THE INTERACTIVE COLLEGE SUGGESTING SYSTEM OF

INTERACTIVE LEARNING SYSTEMS, INC.

ENTER INSTRUCTIONS WHEN THE COMPUTER PRINTS 4 ASTERISKS
AT THE BEGINNING OF A LINE - LIKE THIS -

****

AS YOU BEGIN THERE ARE ABOUT 2000 COLLEGES IN THE FILE.
****A193.-
A193 MAJ AVAIL PSYCHOLOGY
 675 COLLEGES QUALIFY.

****A201.-
A201 MAJ AVAIL SOCIOLOGY
 568 COLLEGES QUALIFY.

****S106.-
S106 STU BODY NOT ALL MEN
 531 COLLEGES QUALIFY.

****A75.-
A 75 LIBERAL ARTS COLLEGE
 365 COLLEGES QUALIFY.

****A90.-
A 90 ADV PLACE FOR WORK COMPL IN H.S.
 282 COLLEGES QUALIFY.

****A112.-
A112 OVER 40% FRESH IN TOP 20% H.S. CLASS
 172 COLLEGES QUALIFY.

****C0883.-
C 883 IS ON LIST.

****L.-
CURRENT OPERATIONS ARE:
A 75 A 90 S106 A112 C0883 A193 A201

****A1.-
A  1 NEW ENGLAND
 15 COLLEGES QUALIFY.
```

Command

A=Consider only those colleges that have this characteristic

201=Characteristic number

S=Consider only those colleges that do **not** have this characteristic

C=Check to see if the college whose I.D. number is 0883 is still on the list of qualifying schools

0883=Smith College

L=List all the commands operating on the list of qualifying colleges

This printout is an example of the interaction between the student at the terminal and the college suggestion system. The student refines his choice and tests to ascertain that specific schools are not excluded by these tests.

EDP Work-Study Programs Gain Favor

Special to Computerworld

BOSTON – A new approach to teaching people how to work with computers is becoming more popular. The students spend part of their time working and part of their time in school.

This technique has been used with great success in many other areas, including retail sales and engineering.

The approach works like this: Both a company and a cooperating computer school advertise for new employees for the firm. The company interviews applicants for job suitability and the school interviews them for educational suitability. After the necessary number of applicants have been accepted, the students are divided into two groups. Half of the students immediately go to work for the company; the other half (while employed by the company) spend their time in school. The groups are later reversed. This process continues until each student has received the same exposure to the company and the educational program.

Normally, the student pays for the training out of his paycheck, while he is in school, and then the company reimburses him if he continues to work for the firm after the schooling is over.

One of the schools offering this type of program is the Academy of Computer Technology in Boston, formerly a division of University Computing Co. The school works in cooperation with local companies who wish to hire and train new employees.

Mrs. Cory to Head Scanner Users

Special to Computerworld

NEW YORK – Bertha Cory, chief of the Statistical Systems and Computer Branch, Army Behavioral Science Research Laboratory, Washington, D.C., has been elected president of the Optical Scanning Users' Group Conference.

Mrs. Cory replaces Jeremy Baker of the Equitable Life Assurance Society as head of the group sponsored by the Optical Scanning Corp.

This Is the Fall Joint Comput

Conference Had Everything-- Even Automated Horoscopes

SAN FRANCISCO – Even astrology yielded to the inroads of computers here last week. One of Hollywood's noted astrologers offered special horoscopes at the Fall Joint Computer Conference.

Carroll Righter, a long time confidant and advisor to many Hollywood stars, combined forces with a Raytheon 703 computer to make his stargazing talents available to visiting scientists and computer people.

Righter's store of information and astrological data for the month of December had been loaded into memory. The attendees typed in their birth dates and the computer prepared a special horoscope for them.

With regard to the significance of astrology, Righter is fond of saying, "The stars impel – they do not compel. What you make of your life is up to you."

Spacewar Game

A new game system, called Spacewar, was demonstrated. The game, previously available only on larger scale systems, was designed and programmed on Data General Corp.'s 4K Nova computer.

Two warring rocketships appear on a CRT display. Their object is to destroy one another. The rocketships are in the vicinity of a large star, and the gravitational effects of the star on the rocketships and their missiles are calculated into the continuously changing display.

Two contestants use a console with controls to do the following:

1. Accelerate his ship with two thrust levels.
2. Rotate the ship clockwise and counter-clockwise.
3. Fire missiles.

The control console displays the following information:

1. The current mass of the rocketship.
2. The number of missiles available.
3. The amount of fuel remaining.

The object of the game is to shoot down the opposing spaceship with missiles. The game runs for three minutes or until one of the opponents has been destroyed.

New Computer

The Decade 70, the latest addition to Decade's line of low-cost high speed digital computers, was shown for the first time here last week.

The system has an 860 nanosecond cycle time, is rack mounted, and is aimed at the original equipment manufacturers' market. The system sells for $12,800 with a standard 4K by 16 bit memory,

Astrologist Carroll Righter looks over a printout from the Raytheon 703 computer which he programmed to generate personalized horoscopes.

expandable to 16K, parity, and memory protect.

Delivery is "off the shelf" (two weeks) and includes operational software for a single pass assembler, Fortran IV, Chat, a mathematical package, and utilities.

Univac Display System

A communications oriented display system, one of the first to use the deflection-beam technique, was demonstrated by Univac.

The system, called the 1557/1558 Graphic Display Subsystem, is composed of a display and a display controller. The unit has sufficiently high resolution to permit the mapping and design of logic circuitry right on the screen. Other applications could include automotive design, architectural design, and on-line animation.

The keyboard unit contains the standard alphanumeric keyboard with 40 function keys. There is a light pen for operator input. The unit can plot randomly positioned points, vectors, and alpha data in tabular mode.

The display has a usable area of about 12" by 12", and the data is positioned in a 1024 by 1024 point matrix. Two intensity levels are permitted, and 90° rotation is permitted under program control.

A software package is available for this system, including data management routines, and I/O control for the display. The software is designed for the 1108 computer system, but should work on any large scale general purpose computer, according to the manufacturer.

SDS Display Unit

A new graphic display unit from Scientific Data Systems was demonstrated in conjunction with its Sigma 5 computer and SDS Cobol-65.

The display emphasis was on computer aided design. An AC circuit designer used the interactive display to demonstrate on-line design techniques. The display could also be used for real-time data analysis, control, simulation, and dynamic perspective development, according to the manufacturer.

Attendees were shown the use of the Sigma 7 computer on a time sharing basis, through use of terminals in the booth. The system was connected to the company's computer center in El Segundo, Calif., via teletypewriters.

As the spaceship at upper right fires missiles at the pulled off course by the gravitational field of the star

Time Sharing

A special support system to aid the debugging of programs under a time shared system was described at the conference.

According to the IBM people presenting the approach, "The most far reaching implication of this support system is that it paves the way for a time sharing system that can 'learn' to debug itself."

The system would incorporate a "learned optimum" action to take in a given situation, through the techniques of gaming. With the accumulation of information, the program "learns" to select the best alternative for a given situation.

The system was described in a paper, "Debugging in a Time Sharing Environment," authored by W.A. Bernstein and J.T. Owens from IBM Systems Development Division.

Memories

Several new memories were demon-

TV Techniques Used to Improve Display Capability

This video display system, demonstrated by Sally Anderson of the Rand Corporation, can display simultaneously images from different sources. In this case, as the TV camera transmits her picture to the screen, the words she is writing on the electronic tablet are processed by computer, stored on a video disk, and transmitted to the screen.

Special to Computerworld

SAN FRANCISCO – A computer based image display system that could make the television monitor as important as the telephone in the office of tomorrow was described here last week.

The system, developed by the Rand Corporation and built by IBM, is in operation at Santa Monica, Calif. The unit serves as the hub of a video-electronics system which will eventually give many scientists access to data stored in several different computers through television terminals in their offices.

The image generation portion of the system is linked to an IBM 1800 Data Acquisition System which is, in turn, linked to a 360/40.

"There are three television consoles in operation now, but we expect to add 29 more next year. The system could handle several hundred consoles in individual staff member offices," according to Thomas O. Ellis of Rand.

"These television monitors will be used in much the same way as the telephone, with new information channels becoming constantly available to users just as phone lines are now," he added.

Images Stored on Disks

The television images are stored on a large spinning disk and are transmitted to the user's terminal via coaxial cable. The images are flicker free and 32 images can be stored simultaneously.

In order to communicate with the system, a scientist can use several devices including keyboards and the new Rand electronic tablet – a device which allows the user to write images directly on the tablet and have it read by the scanning system. Function controls are included and linked to a computer which modifies the image.

The unit handles gray tones as well as black and white, and permits full animation and live pictures to be routed to the TV terminals. Live broadcasts can be transmitted directly, bypassing the computer, to give up to date information on special items.

Text can be superimposed over a graphic display by reading two tracks of the imge disk simultaneously, giving complete flexibility to the display tech...que.

ıter Conference That Was

the other spaceship, the missiles are star, making the game more difficult.

trated. They included a new drum mem-ry, called the CLC-1 from Bryant Com-uter Products, high speed ferrite stacks rom RCA, and a 150 nanosecond plated vire memory from Ferroxcube.

RCA Time Sharing

The Spectra 70/46 computer system as demonstrated for the first time with transcontinental time sharing system, onnecting the system at the show with a 0/46 computer in Cherry Hill, N.J.

Video data terminals were set up at ooks Hall, and a giant 4' by 8' monitor reen was used to observe what each deo terminal was doing. The screen epicted the activity at the computer nter, and showed what internal func-ons of the system were required.

"Engineers, executives and accountants n use a single time sharing system to lve scientific problems, make manage-ent decisions easier, and calculate week-payrolls at the same time. The Spectra 0/46 is therefore practical for medium large sized business, government, in-strial, and educational customers," ac-rding to James R. Bradburn, RCA ecutive vice president.

Languages supplied for the system in-ude conversational Fortran, on-line bol, on-line editing capabilities, Basic, d general data management capabilities.

rol Wilson, making like an earthling in Land of the Giants, uses an oversized ta terminal as a stage while she explains CA's transcontinental time sharing dem-stration.

Peripheral Manufacturers Meet, Lay Plans for a New Association

Special to Computerworld

LOS ANGELES – The peripheral manufacturers trade association took its first steps towards becoming a reality here last week when representatives of a number of firms met and appointed four regional representatives to recruit new members and to act as an executive committee until the association was formally organized. This probably will occur next May during the Spring Joint Computer Conference.

The meeting here was organized by Henry Sack, publisher of the magazine *Modern Data*, who had intended to step out at this time but was asked to stay on as eastern regional representative for the time being.

The attendees also agreed that since many potential users of computer peripherals did not know where to go to get details of currently available equipment the association would establish an information center about currently available equipment from the association's members.

Other activities approved included the study of the possibility of setting up a nationwide service-maintenance organization, and an exploration of the possibility of developing some forms of standardization in computer peripheral interfacing. A government liason committee to work in the government business area will be formed.

Regional representatives, as well as Henry Sack, are Warren Pugh, Hewlett-Packard, Palo Alto, Calif.; Roy Bower, Houston Instruments, Houston, Texas; and Richard Caveney, Bryant Computer Products, Walled Lake, Mich.

Time Sharing B5500 Handled 48 Users

SAN FRANCISCO – A two month saturation test has demonstrated the ability of the Burroughs B5500 Time Sharing System to perform efficiently and continuously under a very large variety of pressures, it was announced during the Fall Joint Computer Conference.

During the test, 48 terminals in a diverse cross-section of business and industry in the United States and Canada were connected to a B5500 at Remote Computing Corp., Los Angeles. Terminal users were asked to run programs and problems as they wished, whenever they wished, and to push the system as hard as possible to "saturate" the computer at various times.

A concerted effort was made to get all of the 48 users on the system simultaneously with as many jobs as possible. Herb F. Hayde, Burroughs manager of technical systems, manned a terminal and communicated with users, asking for reactions and opinions in a variety of situations.

Dated Entry System

A different style of key-to-tape data entry system was shown at the conference by Sanders Associates Inc. The display screen is used to verify and correct the data being input before it is placed on magnetic tape. Some editing capabilities also are available to the operator at this stage.

Videotape Permits High Density Recording

Special to Computerworld

REDWOOD CITY, Calif. – By the adaptation of videotape recording techniques to tape memories, a new random access memory system with up to 50 billion bits of data storage has been experimentally developed.

This new memory system, developed by Ampex Corp., will "multiply the data density for computer storage by a thousandfold," according to Ampex Vice President William A. Gross. The experimental system uses tape storage, and can be accessed, for a normal request, in under ten seconds.

A finished memory, based on the company's development would enable a computer user to place all of his digital records on-line for immediate access, according to the developer.

The videotape recorder increases recording density by using four recording and playback heads mounted on a small disk that rotates perpendicularly across the moving tape for recording or playback. Conventional digital tape drives have fixed heads that record and play back parallel to the motion of the tape.

The relative increase in tape-to-head speed is a factor of about 6 to 1. This makes it possible to record television pictures, or, when applied to coded data, greatly increases the volume of information that can be stored.

Special Features of Model 37 Teletype Demonstrated

SAN FRANCISCO – The new Model 37 teleprinter was shown by Teletype Corp. and particular emphasis was placed on the usefulness of some of the new features which have been added to the older Model 35 system. The Model 37, available on lease from telephone companies or directly, has both red and black printing, and allows the user to instruct movement of the carriage both vertically and horizontally in half spaces, much like a plotter. In addition, it has both upper and lower case lettering capability.

Graphical Output

The usefulness of these facilities was shown in the production of graphs and mathematical formulas from computer output. Graphic output can be produced simply by first sending a stream of vertical lines, followed by a group of horizontal lines, then by upward spacing the paper while putting the coordinates in. The actual lines can be written in any appropriate characters, with the difference in the values to be plotted being used to move the paper down or up as appropriate.

Mathematical Formulas

Mathematical formulas including indices and subscripts also look considerably more natural with the use of the half line spacing. A line of text can include the formula without having to take up two or three complete lines. Another convenience shown at the exhibit was the use of left-to-right and right-to-left slashes in making up chemical structural formulas. This worked out nicely for benzene compounds and other formulas where only 45° lines are involved; but it was not obvious that it would be equally successful in all cases.

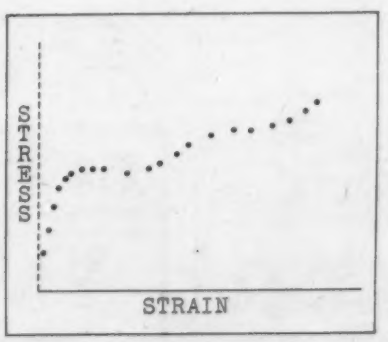
Improved Speed

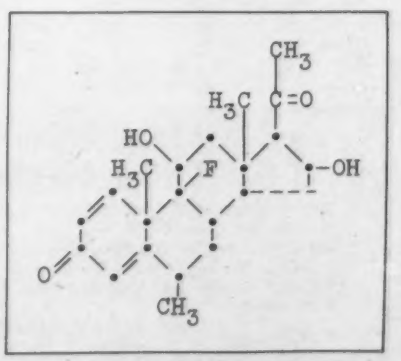
Use of the features of the Model 37 can create considerable overhead in time. However, the model prints 50% faster than previous teletypewriters, up to 150 wpm or 15 cps. Teletype foresees the new system playing a major role in time-shared operations.

$$(a+b)^2 = a^2 + 2ab + b^2$$

$$e^x = 1 + X + \frac{x^2}{2!} + \frac{x^3}{3!} + \frac{x^4}{4!} \cdots\cdots$$

$$O_2 + 2H_2O + 4e = 4OH^-$$





New features built into the Model 37 Teletype enable it to produce graphs, formulas, and structural diagrams.

New 'Fetch' System Called Easy to Use

MINNEAPOLIS, Minn. – A new generalized information retrieval system has been announced by Computer Time Sharing Inc.

The system, called Fetch, is, "truly general purpose . . . easy to use . . . and extremely flexible," according to the company's president, Albert M. Sheldon, Jr.

Computer Time Sharing, the developer, feels that, "Anyone, even those with no programming experience, will be able to learn Fetch and put it to practical use on their own retrieval problems in an amazingly short period of time. As a matter of fact, our secretaries were able to use Fetch after about 20 minutes of instruction."

The program is a generalized information retrieval package, with selective parameters input over terminals in the conversational mode. The system allows several parameters (up to 1000) to be selected in various priorities and then applied to a file search.

The package is available over the company's time sharing system at the usual $10 per hour connect time and 8 cents per second for CPU time. The program runs on a CDC 3300 with software written by the company.

3 Management Science Packages to Be Offered

Special to Computerworld

WELLESLEY HILLS, Mass. – Three management science packages will soon be available for solving complex business problems.

Honeywell's EDP division announced that the three packages incorporate material for mathematical, statistical, and operations research methods into computerized routines which can be run as part of the normal job flow on the Series 200 computer system.

The three packages include:

- Pert, a planning and modelling system for scheduling and evaluating large scale projects. The programs can run on any 16K or over Series 200 machine.
- MPS-200, a mathematical programming system for modular, open ended solutions for systems of linear equations. This approach is useful for resource allocation, inventory management, market planning, and research. The MPS-200 programs require 128K of main memory and 5 million characters of auxiliary storage, of which 1.5 million must be available on the system's resident file.
- GPS, a general purpose simulator package that uses a mathematical model to reflect the changes on resources and resource allocation with regard to current programs. It provides the manager the opportunity to examine possible results of current or future planning. The system can run on any system with 65K or greater main memory with the scientific unit.

Motor Vehicle, Inventory Systems Made Available

Special to Computerworld

COLLEGE PARK, Md. – A new motor vehicle system and a new wholesale goods inventory control system have been announced here.

The new Motor Vehicle Operation Cost System, announced by Delta Data Systems, is designed to provide management personnel with cost breakdowns on gas and oil consumption, costs per mile, costs per operating hour, and overall operating costs on up to 99 different vehicle designations.

All costs are distributed at fleet and divisional levels, and vehicle costs are compared to standards for vehicle designations.

The package is written in Cobol for a tape oriented Honeywell computer system.

The Wholesale Goods Inventory Control System is designed to provide the wholesalers with a comprehensive management aid for control of inventory costs.

The basic system can process 21 types of inventory transactions, and includes a complete purchase order subsystem. Nineteen reports are produced, indicating inventory levels and purchases for management.

The system contains 20 Cobol programs, and was written for the S/360 disk oriented environment.

The motor vehicle system will cost $6000 and the inventory control system will sell for $15,000.

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Exchange of UCC Stock For Gulf Stock Approved

Special to Computerworld

DALLAS – Four propositions necessary to the plan to exchange Gulf Insurance Co. common shares for approximately $200 million in University Computing Co. common shares have been approved by stockholders at a special meeting Dec. 6.

The exchange previously had been approved by the UCC's directors.

University Computing's quarter interest in Gulf, 700,000 shares acquired earlier this year in exchange for 350,000 University Computing shares, was not included in the $200 million value of the merger.

The agreement calls for the exchange of 0.55 University Computing shares for each of the approximately 2.1 million outstanding Gulf shares not owned by University Computing.

The transfer of assets, business, and name changes will be accomplished as of Dec. 31, the companies said. The Gulf Insurance group will continue its insurance operations with the same management and personnel, the firms said.

While Gulf will become a Missouri corporation, its executive offices will remain here, and the name of Gulf Insurance Co. will be retained, Gulf said.

Burroughs Plans New Bond Issue

LONDON – Burroughs Corp. has announced that its British subsidiary, Burroughs Machines Ltd., plans to offer publicly six million pounds ($14.4 million) of 3-3/4% sterling-dollar convertible bonds due between 1977 and 1982.

Proceeds from the bonds, convertible into parent company stock at $280 per share, are to be used in part for repayment of short and medium term loans and to finance continuance of an expansion program.

Selected Computer Stocks Seen as an Excellent Buy

Special to Computerworld

NEW YORK – Now seems an excellent time to buy selected computer stocks, says Paine, Webber, Jackson & Curtis, a nationwide investment firm.

Prospects for the computer industry "are bright enough to justify a number of commitments," says analyst Robert A. Sullivan in a research report released recently.

"The computer industry is the fastest growing major industry," Sullivan writes. Leading computer manufacturers "are diversified, well financed, well managed, proven companies" and industry and company earnings prospects are impressive, he notes.

In the computer industry's short 16 year history, U.S. manufacturers have placed more than 66,000 computers, with 40% of these, or 26,000, placed in the last 22 months, Sullivan said. Now, there are unfulfilled orders for nearly 20,000 computers, he said.

Various studies suggest there will be more than 100,000 computers in place by 1970 and perhaps 170,000 by 1975, he said.

"Obviously, the computer industry is still in its infancy and we expect the industry's dollar revenues to grow at a handsome 15% to 20% annual rate over the next five years," Sullivan said.

He lists certain key characteristics of the industry:

- Some 70% of computers installed are leased rather than purchased. Leased computers tend to produce significantly more total net profit than computers sold outright. Moreover, rental revenues are more stable.
- "Computers have affected almost every aspect of life," invalidating the concept that they are only office machines.
- The U.S. government continues to be the industry's largest customer "and its purchases are not normally affected by business fluctuations."

Computer stocks "are down and available at lower than normal price-earnings ratios – especially in comparison with the overall market," Sullivan observes. "We don't believe the fundamentals justify the weakness – and the industry's prospects remain outstanding."

Four Recommendations

For current purchases, Sullivan especially recommends:

- IBM (328): Earnings growth may slow in 1969, he says, but only because of the recent increased proportion of sales to leases. "We consider this very favorable," he said. "We believe the recent weakness provides an excellent buying opportunity for long-term growth investors." (This was written before Control Data filed the antitrust suit against IBM and before IBM announced it was studying its pricing policies.)
- Sperry Rand (48): "The second largest computer company continues to offer attractive earnings and technological progress," the report notes.
- Burroughs (246): "A much improved company."
- General Electric (98): "More conservative accounts may be attracted by GE's improving computer, nuclear, and jet engine business," he observes. Computers account for a small but growing portion of GE's business.

Joint Leasing Venture Proposed

NEW YORK – The directors of Armco Steel Corp. and Gatx-Boothe Corp. have agreed in principle to establish a joint venture to engage in financing and leasing of major capital equipment.

Armco has also agreed to make a cash purchase of 100,000 shares of common stock of Boothe Computer for $51 per share. This will represent approximately 6% of the outstanding stock. The entire proceeds will be paid to Boothe Computer.

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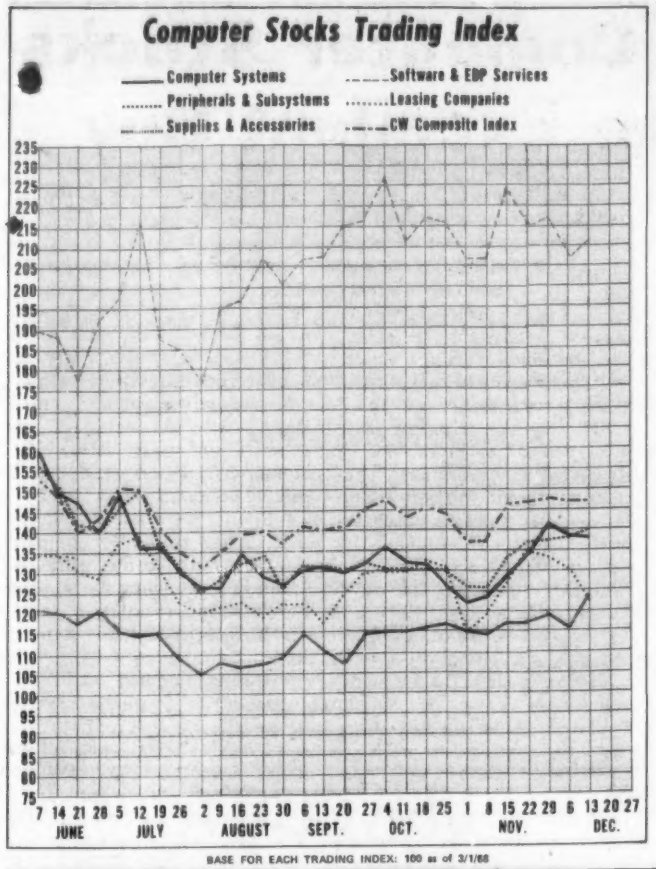

BASE FOR EACH TRADING INDEX: 100 as of 3/1/68

CW Stocks Mixed, DJ Moves Higher

Computer stock prices showed considerable movement during the week ended Dec. 13, but the result was a toss up. Twelve *Computerworld* listed stocks rose 10% or more while six fell 10% or more. In total, 47 stocks gained while 50 fell, and eight remained unchanged. The *Computerworld* composite stock index remained unchanged at 147.

Other major indexes reflected this general indecisiveness. The Dow-Jones Industrial average gained 3.05 points (0.31%) to close at 981.29, while the New York Stock Exchange composite average eased off .07 points (0.12%) to 60.96.

Year End Rally

Many analysts still feel the market has begun its awaited year end rally, despite the uneasiness in recent weeks about the monetary situation. The Dow-Jones is expected to flirt with its record of 995 in the near future.

CDC's Stock Falls

Control Data, which filed an antitrust suit against IBM while the market was closed on Wednesday, showed the second sharpest loss in the Computer Systems sector (which fell 1 point – 0.72% – to 138). CDC dropped 11 points (6.83%) to 150. IBM showed a smaller decline of 9-1/2 points (2.91%) to 316-1/2. Systems Engineering Labs' 2-1/2 (7.66%) loss topped CDC's. Large gains were made by Scientific Control, up 3-1/2 (8.97%), and Digital Equipment, up 13-1/8 (8.01%).

Peripherals & Subsystems

Three stocks in the Peripherals & Subsystems sector (up 2 or 1.45%, to 140) rose more than [illegible]: Electronic Memories, up 7-1/2 (12.60%); Photon, 3-1/2 (12.28%); and Information Displays, 2-3/4 (11.70%). Scan-Data's 12 point (13.04%) drop was the third largest among computer stocks. Gainers outnumbered losers 15 to 10 in the sector.

Standard Register's 5-1/4 (20.19%) gain led all EDP stocks. The stock had previously stood 24% below its March 1 base price. Nashua Corp., which had stood at 28% below its base, was the only other large gainer in the Supplies & Accessories sector (up 2 points or 1.64% to 124). Nashua rose 6-1/8 (14.50%) to 48-3/8.

Software & Services

The greatest activity was to be found in the Software & EDP Services sector, which was up 4 (3.28%) to 211. Seven stocks gained 10% or more: Computer Environments, 2-1/2 (20.00%); Computer Usage, 7 (19.18%); Brandon Applied Systems, 2 (13.79%); Digitek, 1-1/2 (12.50%); United Data Centers, 1-1/4 (11.63%); URS Systems, 3-1/2 (11.11%); Strategic Systems, 4 (10.26%).

Software Systems

Software Systems led the losers in the table with a 1-1/2 point (13.64%) loss. Programming & Systems and Advanced Computer Techniques were down 10%.

Leasing Sector

While only two stocks in the Leasing sector – Management Assistance, down 2-1/4 (13.43%), and Lectro Computer Leasing, down 1 (11.77%) – lost 10% or more, losers outnumbered gainers 2 to 1 in the sector. The sector index fell 7 points (5.49%) to 123.

COMPUTER STOCKS: TRADING SUMMARY

WEEK ENDED DEC. 13, 1968

EXCHANGE	BASE PRICE 3-1-68	1968 RANGE	CLOSING PRICE	COMPUTER SYSTEMS	WEEK NET CHANGE	WEEK % CHANGE	% CHANGE FROM BASE
NYSE	163 3/8	253–157	239 3/4	* Burroughs	– 11	– 4.39	+ 46.75
NYSE	67 3/4	110– 54	72 1/4	Collins Radio	+ 3	+ 4.33	+ 6.64
NYSE	101 1/2	174– 94	150	* Control Data	– 11	– 6.83	+ 47.78
AMSE	102	164– 95	177	* Digital Equipment	+ 13 1/8	+ 8.01	+ 73.53
NYSE	19 1/8	27– 18	24 3/4	Electronic Assoc.	+ 1 3/8	+ 5.88	+ 29.41
NYSE	87 1/4	100– 81	96 1/2	General Electric	– 1 3/4	– 1.78	+ 10.60
NYSE	60	91– 59	86 7/8	Hewlett-Packard	– 1 3/4	– 1.98	+ 44.79
NYSE	93 1/8	144– 89	118 1/2	* Honeywell	– 4	– 3.27	+ 27.25
NYSE	288 1/2	375–280	316 1/2	* IBM	– 9 1/2	– 2.91	+ 9.70
NYSE	103 7/8	153– 40	126 1/2	* NCR	+ 2 1/2	+ 2.02	+ 21.78
NYSE	46 7/8	53– 44	48 1/4	RCA	+ 7/8	+ 1.31	+ 2.93
NYSE	39 1/8	53– 44	49 7/8	Raytheon	– 1/8	– 0.25	+ 27.48
OTC	22 1/2	66– 20	42 1/2	* Sci. Control Corp.	+ 3 1/2	+ 8.97	+ 88.89
NYSE	78 3/4	114– 72	97	* Scientific Data	—	—	+ 23.17
NYSE	45	63– 42	49 5/8	* Sperry Rand	—	—	+ 10.28
AMSE	22 1/2	39– 20	30 1/8	* Systems Eng. Labs	– 2 1/2	– 7.66	+ 33.89

EXCHANGE	BASE PRICE 3-1-68	1968 RANGE	CLOSING PRICE	PERIPHERALS & SUBSYSTEMS	WEEK NET CHANGE	WEEK % CHANGE	% CHANGE FROM BASE
NYSE	58 3/8	91– 52	75 7/8	Addressograph-Multigraph	– 7/8	– 1.14	+ 29.98
OTC	21	85– 42	72	Alphanumeric	– 2 1/2	– 3.36	+ 242.86
NYSE	29	41– 26	41 7/8	Ampex	+ 2	+ 5.01	+ 44.40
OTC	17 1/4	27– 14	17 1/4	Bolt, Beranek & Newman	– 1 1/4	– 6.76	—
NYSE	13 1/2	27– 14	17 1/8	Bunker-Ramo	+ 1/2	+ 3.01	+ 26.85
AMSE	32 1/8	50– 27	38 3/8	* CalComp	+ 3/8	+ 0.99	+ 19.45
OTC	24 1/2	49– 20	39	Cognitronics	– 2	– 4.88	+ 59.18
OTC	12	18– 10	16 1/8	Computer Equipment	– 1 3/8	– 7.86	+ 34.37
AMSE	15 1/4	23– 13	21 3/4	* Data Products	+ 1 1/8	+ 5.45	+ 42.62
OTC	19 1/4	27– 16	23	* Digitronics	+ 1	+ 4.54	+ 19.48
OTC	39	67– 32	67	* Electronic Memories	+ 7 1/2	+ 12.60	+ 71.79
OTC	10	29– 9	14 1/8	* Fabri-Tek	+ 3/4	+ 5.61	+ 41.25
OTC	20 5/8	65– 16	39 1/4	Farrington Mfg.	+ 2	+ 5.37	+ 90.30
OTC	12 1/2	26– 10	26 1/4	Information Displays	+ 2 3/4	+ 11.70	+ 110.00
AMSE	16 7/8	52– 14	28 1/2	Milgo Electronics	+ 1 1/2	+ 5.55	+ 68.89
AMSE	57 1/2	108– 54	71 3/8	* Mohawk Data Sciences	– 3 3/8	– 4.52	+ 24.13
OTC	74	145– 71	136	* Optical Scanning Corp.	+ 1	+ 0.74	+ 83.78
OTC	18	42– 16	32	Photon	+ 3 1/2	+ 12.28	+ 77.78
AMSE	25 5/8	38– 12	30	* Potter Instrument	– 1 1/4	– 4.00	+ 17.07
OTC	40 1/4	99– 38	79	* Recognition Equipment	– 3	– 3.66	+ 96.27
AMSE	16	29– 14	23	Rixon Electronics	+ 5/8	+ 2.79	+ 43.75
NYSE	46 1/8	66– 42	59 3/4	Sanders	+ 1/2	+ 0.84	+ 29.54
OTC	47	155– 53	80	Scan-Data	– 1/2	– 13.04	+ 70.21
OTC	40 1/2	51– 35	35	* Tally Corp.	+ 1	+ 2.94	– 13.58
NYSE	242 1/4	321–229	273	Xerox	– 2	– 0.73	+ 12.58

EXCHANGE	BASE PRICE 3-1-68	1968 RANGE	CLOSING PRICE	SUPPLIES & ACCESSORIES	WEEK NET CHANGE	WEEK % CHANGE	% CHANGE FROM BASE
OTC	48 1/2	64– 37	42	* Acme Visible	– 1 1/2	– 3.47	– 13.40
NYSE	20 1/2	32– 18	21 1/8	Adams-Millis	– 5/8	– 2.87	+ 3.05
OTC	13 5/8	26– 13	26	* Baltimore Business Forms	+ 1 1/2	+ 6.12	+ 90.82
AMSE	27	44– 21	29 5/8	* Barry Wright	+ 1 1/4	+ 4.40	+ 9.72
OTC	31 1/4	40– 26	36 1/2	Data Documents	—	—	+ 16.80
OTC	27 1/4	44– 26	43 1/2	* Ennis Business Forms	– 3/4	– 1.70	+ 59.63
NYSE	84 1/8	119– 81	107 5/8	* 3M Company	– 5 1/4	– 4.65	+ 27.93
NYSE	58	93– 48	83 5/8	* Memorex	– 3 5/8	– 4.16	+ 44.18
OTC	27 1/4	32– 25	32	* Moore Business Forms	+ 1	+ 3.22	+ 17.43
NYSE	57 1/4	48– 24	48 3/8	Nashua Corp	+ 6 1/8	+ 14.50	– 15.51
OTC	31 1/4	55– 40	48	Reynolds & Reynolds	+ 1/2	+ 1.05	+ 53.60
OTC	34 1/2	39– 24	31 1/4	* Standard Register	+ 5 1/4	+ 20.19	– 9.42
NYSE	37 3/4	44– 30	34 5/8	* Uarco	+ 1/2	+ 1.46	– 8.28
AMSE	14 1/4	23– 13	22 1/4	Wabash Magnetics	– 1/8	– 0.56	+ 56.14
OTC	25 3/4	37– 24	31 1/2	* Wallace Business Forms	—	—	+ 22.33

EXCHANGE	BASE PRICE 3-1-68	1968 RANGE	CLOSING PRICE	SOFTWARE & EDP SERVICES	WEEK NET CHANGE	WEEK % CHANGE	% CHANGE FROM BASE
OTC	7 1/2	25– 7	13	Advanced Computer Techniques	– 1 1/2	– 10.35	+ 73.33
OTC	17	36– 14	34	* Applied Data Research	—	—	+ 100.00
OTC	15 1/2	23– 13	15 3/4	* Aries	—	—	+ 1.61
AMSE	47	75– 42	73 1/2	Automatic Data Processing	– 1 3/4	– 2.33	+ 56.38
OTC	4	19– 4	16 1/4	Automation Sciences	—	—	+ 306.25
OTC	4 1/2	23– 3	16 1/2	* Brandon Applied Systems	+ 2	+ 13.79	+ 266.67
AMSE	22 7/8	43– 19	21 7/8	Computer Applications	+ 1/2	+ 2.34	– 4.37
OTC	5	15– 7	15	Computer Environments	+ 2 1/2	+ 20.00	+ 200.00
OTC	30	64– 24	58	Computer Network	– 1	– 1.70	+ 93.33
NYSE	40	64– 36	61	* Computer Sciences	– 2 3/4	– 4.31	+ 52.50
OTC	39	62– 28	43 1/2	* Computer Usage	+ 7	+ 19.18	+ 11.54
AMSE	36 1/2	82– 36	82	* Computing & Software	+ 2 1/2	+ 3.14	+ 124.66
OTC	12 1/2	23– 5	22 1/2	Datamation Services	+ 1	+ 4.65	+ 80.00
OTC	14 1/2	22– 10	20	Datatab	– 1/2	– 2.44	+ 37.93
OTC	12 1/2	20– 9	13 1/2	* Digitek	+ 1 1/2	+ 12.50	+ 8.00
AMSE	38 3/8	52– 26	32 1/2	Electronic Computer Prog. Inst.	– 1 3/8	– 4.06	– 15.31
OTC	35	68– 32	66	Informatics	—	—	+ 88.57
OTC	21	28– 4	19 1/2	Matrix Corp.	– 1	– 4.88	– 7.14
OTC	5	28– 4	20	* National Computer Analysts	– 1	– 4.76	+ 300.00
AMSE	31	61– 28	61 1/4	Planning Research	+ 2	+ 3.37	+ 97.58
OTC	a13 1/4	a15– 10	10 1/2	Programming & Systems	– 1 1/4	– 10.64	– 20.76
OTC	9	15– 18	9 1/2	Software Systems	– 1 1/2	– 13.64	+ 5.55
OTC	a29 1/2	a43– 8	43	Strategic Systems	+ 4	+ 10.26	+ 45.76
OTC	20 1/2	22– 10	11	TBS Computing Centers, Inc.	+ 1/4	+ 2.32	– 46.34
OTC	a12	a12– 10	12	United Data Centers	+ 1 1/4	+ 11.63	—
OTC	63	182– 57	168	University Computing	– 4	– 2.33	+ 166.67
OTC	a20	36– 20	35	URS Systems Corp.	+ 3 1/2	+ 11.11	+ 75.00
OTC	a30	a30– 22	23 1/2	U.S. Time-Sharing	– 1/2	– 2.08	– 21.67

EXCHANGE	BASE PRICE 3-1-68	1968 RANGE	CLOSING PRICE	LEASING COMPANIES	WEEK NET CHANGE	WEEK % CHANGE	% CHANGE FROM BASE
OTC	18	55– 18	50	Boothe Computer	+ 3 1/2	+ 7.53	+ 177.78
OTC	4 1/4	24– 4	15	Computer Exchange	– 1	– 6.25	+ 252.94
AMSE	25 1/8	36– 21	23 7/8	* Computer Leasing	– 1	– 4.02	– 4.92
OTC	a15 3/8	15– 9	15 1/4	Continental Computer	+ 1 3/8	+ 7.96	– 0.81
OTC	12 1/4	19– 11	12 3/4	* Cyber-Tronics	– 1/4	– 1.92	+ 4.08
AMSE	106 5/8	92– 44	64 7/8	* Data Proc. Financial & General	– 4 7/8	– 6.89	– 38.22
OTC	12 1/2	17– 8	17 1/2	Datronic Rental	+ 1 1/2	+ 9.37	+ 40.00
OTC	20	59– 18	54 3/4	Dearborn Computer	+ 3 3/4	+ 7.35	+ 173.75
OTC	13 1/4	19– 12	14 3/8	* DPA, Inc.	– 1/4	– 1.71	+ 8.49
AMSE	28 3/4	43– 25	29 1/2	* Greyhound Computer	+ 1 5/8	+ 5.83	+ 2.61
AMSE	28 1/8	69– 36	43	Granite Equipment Leasing	– 7/8	– 2.00	+ 52.89
AMSE	49	139– 41	130 3/4	* Leasco	– 8 1/4	– 5.94	+ 166.84
OTC	5	14– 5	7 1/2	Lectro Computer Leasing	– 1	– 11.77	+ 50.00
AMSE	30 3/4	66– 27	53 5/8	* Levin-Townsend Computer Corp.	– 2 3/4	– 4.88	+ 74.39
OTC	10 1/2	16– 8	8 1/4	* LMC Data, Inc.	+ 1/8	+ 1.54	– 21.43
OTC	10 7/8	16– 10	14 1/2	* Management Assistance	– 2 1/4	– 13.43	+ 33.33
AMSE	41 5/8	53– 25	35 1/2	National Equipment Rental	– 1 1/2	– 4.06	– 14.72
OTC	a13 1/4	14– 8	10 1/4	NCC Leasing	– 1/4	– 2.38	– 22.64
AMSE	38	64– 35	41 1/8	* Randolph Computer Corp	– 1 7/8	– 4.36	+ 8.22
OTC	10 1/2	53– 10	49	System Capital Corp.	– 2	– 8.92	+ 366.67
AMSE	10 7/8	25– 10	24 7/8	U.S. Leasing	+ 1 1/4	+ 5.29	+ 128.74

a—Since 10/18/68 *Companies included in Computerworld's stock trading index for each sector.

Multiprogramming DOS Capabilities To Be Expanded

(Continued from Page 1)

Other new features to be included in the release will permit relative addressing for IBM 2311, 2314, and 2321 direct access storage facilities. They will also include trailer label processing for random access files and a means of obtaining control of the system prior to the abortion of the user's job.

Implementation Discussion Held

(Continued from Page 1)

ment represents about 10% of the total computers used in the world, and therefore any standard it adopts affects the entire industry. This places a responsibility on the government to adopt carefully chosen standards, and to define them most precisely, according to a spokesman for the General Services Administration.

One of the main points proposed by Dr. Grosch was that he felt that any minimum defined for a specific level of Cobol should also be, in effect, a ceiling. There should be no tolerance between these limits. This point received no support from those attending; in fact, everyone present raised very strong arguments against such a viewpoint.

The main reason for this desire for a floor-equals-ceiling standard is the desire that programs be completely interchangeable, according to Dr. Grosch. "With something over 3000 installations and something over 4000 computers, the government cannot afford to have compatibility problems between systems and installations."

Peter Ingerman, spokesman for RCA, objected to this viewpoint very strongly. "There should only be floors for the standard, not ceilings. There is no conceivable way whereby complete interchangeability can be achieved," he said. "The problems of government's internal management are not the responsibility of the computer industry."

A possible solution was raised by Dr. Grace Hopper, speaking as an expert in the area of compilers and languages. "Pre-compilers are highly economical. They can reduce the number of compilations necessary, control language standards, provide syntax checking, and generally improve documentation standards. Pre-compilers would allow any installation to enforce any language standard, regardless of the actual level of compiler used."

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IBM Says That It Will Fight CDC's Antitrust Charges

(Continued from Page 1)

Control Data has attacked what it considers to be discriminatory and exclusive pricing practices. CDC is claiming that direct discounts have been given in the form of "value received" contracts, "buy backs" of computer time which may not have been utilized, even outright discounts from standard published prices. Indirect discrimination also has occurred, Control Data claims, as a result of the provision of free manpower for programming, maintenance, and systems support. These discriminatory prices, CDC says, have been given to customers where the IBM market share is less dominant, where there is a case of intense competition, and where there is prestige or sudden other ancillary benefits to be obtained. Control Data also claims that IBM has subsidized some of its systems by establishing prices at a significantly lower percentage of return where they are not in a strong position and that it is using the revenues from the sale and lease of other systems to provide the money for marketing of these subsidized computers. Another claim is that in certain cases computers have been sold or leased at a loss for the purpose of handling competition.

Software, Maintenance Tie-Ins

The hardware/software and maintenance argument is aired in the complaint, with Control Data alleging that IBM has tied these together rather than pricing each separately and that this has hindered the development of hardware maintenance companies and software companies, and that this practice was used to camouflage discriminatory prices and concessions. CDC also argues that these practices have reduced the number of potential competitors by requiring competitors to have large amounts of capital available in order to compete effectively.

Unnecessary Standards Alleged

A fourth area of complaint deals with the whole structure of computer markets. Here Control Data is arguing that the current structure has been dominated by IBM. In particular, it is claimed that many technical standards have been used by IBM to reduce the marketability of competitive computers and peripheral equipment. Control Data claims that standards have frequently been unnecessary and have been introduced without prior notice to the industry or to customers. It also argues that the joint ventures between IBM and a number of its customers to develop new computer program languages have also been an exploitation on the part of IBM.

Purchase vs. Renting

Control Data claims that the leasing problem still continues, with IBM making it appear more economically advantageous to lease computers than to have increased maintenance charges on newly purchased computers, that corresponding increases are not included in the rentals. It also claims that the corporation has maintained recent prices for its used computers at levels near the price of its new computers while establishing low trade-in values for used computers.

Coercion Alleged

Also brought up is a series of complaints of coercion by IBM of both its customers and its own personnel. The complaint claims that IBM has coerced customers in a number of ways including direct threats and other forms of intimidation of the customers' procurement personnel by demanding immediate acceptance of its systems, misrepresenting performance of its computers during benchmark tests, and by causing or arranging for IBMers to take positions, such as directors or consultants, in customer firms. Coercion of its own employees is claimed by Control Data primarily as a result of "unreasonable quotas and severe penalties for the loss of orders, customers, or prospects." The complaint also says that IBM has put unreasonable barriers against its employees working for competitors after terminating employment with IBM.

Bait and Switch Tactics

Among other items brought out in the complaint is a claim that IBM has practiced "bait and switch" techniques for securing contracts so as to eliminate its competitors and then trying to cancel the contract and sell a different, and perhaps more expensive, computer. It also mentions the master contracts which it says frequently deal with tabulating equipment rather than computers, and which lack written particulars concerning terms, specifications, prices, or manpower commitments made by IBM to the customer.

A jury trial has been requested, except for assessment of damages. The trial could take place as early as April, but it is not expected to occur before 1970.

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